

REMARKS

Request for Withdrawal of Finality

The finality of the pending Office Action is premature. See MPEP 706.07. A new ground of rejection was entered in the Final Action against previously pending and un-amended claims.

Claims 4, 6 and 7 were previously objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form (§ 3, Office Action dated May 29, 2008). Now they are considered rejected in the pending Final Office Action (§ 3, Office Action dated December 9, 2008). Since the claims were not twice rejected, Applicants respectfully request withdrawal of the finality of the pending action.

New Claims

Newly submitted claims 24 and 34 include all of the limitations of pending claim 4 and limitations of the base claim and intervening claims. Claim 4 was objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form (§ 3, Office Action dated May 29, 2008).

Assignee respectfully requests reconsideration of the rejections of pending claims 1-16 and 19-36, including independent claims 1, 16, 21, 24 and 34.

Claim 1: 35 U.S.C. § 102(e)

Independent claim 1 is directed to a method for enhancing communication in a noisy environment. The method includes processing the input signals of each microphone array by a beamformer to determine temporal and spatial information about the input signals of each microphone array.

U.S. Patent App. Pub. No. 2003/0185410 A1 ("June") does not teach or suggest processing the input signals of each microphone array by a beamformer to determine temporal and spatial information about the input signals of each microphone array. Specifically, June does not teach or suggest processing the input signals of each microphone array by a *beamformer*. A beamformer takes advantage of acoustic interference to change the direction of the array. *Beamforming* – *Wikipedia, the free encyclopedia*,

<http://en.wikipedia.org/wiki/Beamforming> (last visited Feb. 5, 2009) (hereinafter "Wikipedia article").

Instead, June discloses a sound source direction estimation unit that receives an inputted signal with a speech signal determined to have a speech signal value over a predetermined level (para. [0042]). The sound source direction estimation unit calculates an "energy" function of the inputted signal (para. [0052]). The angle having the maximum energy is determined as the direction of the speech signal (para. [0056]). The angle of the direction of the speech signal is fed to a control unit that physically rotates the microphone array to face the speaker (para. [0057]). Thus, June's sound source direction estimation unit does not take advantage of acoustic interference. Instead, June's sound source direction estimation unit looks for a direction of maximum energy.

Furthermore, June's sound source direction estimation unit does not use acoustic interference to change the direction of the array. Instead, June uses a control unit to physically, not acoustically, change the direction of the array.

Summation of time-delayed signals is not sufficient to take advantage of acoustic interference to change the direction of an array. The time-delay may merely account for differences in electrical wire length between the microphones and the summer. Therefore, June does not teach or suggest processing the input signals of each microphone array by a beamformer. Therefore, Applicants respectfully request withdrawal of this rejection.

Claim 16 and 21: 35 U.S.C. § 103(a)

Independent claims 16 and 21 are directed to a communication system. The communication system includes a digital signal processing means having an output to provide processed output signals to at least two loudspeakers.

The Office Action acknowledges that June does not teach a digital signal processing means having an output to provide processed output signals to at least two loudspeakers (¶ 7, Office Action dated December 9, 2008).

June discloses an orthogonal circular microphone array system. June's system is a large, rotating three-dimensional spherical structure and is intended for implementation on a robot or doll (FIGS. 2A, 2B; ¶ [0028]).

U.S. Patent No. 6,363,156 ("Roddy") discloses an integrated communication system for a vehicle (abstract). The Roddy system addresses a concern for the limited amount of space inside a vehicle (see, e.g., col. 1:22-25 ("[a] particular problem encountered in [prior art systems] is acoustic feedback between the speaker and closely spaced microphones located at each occupant position", emphasis added); col. 2:13-18 (expressing a desire to reduce the parts and cost of a communication system); col. 2:54-58 (expressing a preference to minimize duplication of components by using the existing speakers of the audio entertainment system).

Thus, Roddy's concern for a limited amount of space inside a vehicle teaches away from June, which is instead requires a large amount of space for its rotating spherical structure. Furthermore, June is instead intended for external placement on a robot or doll, and not for the confined, internal space of a vehicle. For these same reasons, June renders Roddy unsatisfactory for its intended purpose and/or June changes the principle of operation of Roddy. MPEP §§ 2143(G), 2143.01.

U.S. Patent No. 7,206,418 B2 ("Yang") also does not teach or suggest a digital signal processing means having an output to provide processed output signals to at least two loudspeakers. Therefore, Applicants respectfully request withdrawal of this rejection.

Claim 3: 35 U.S.C. § 103(a)

Dependent claim 3 is directed to a method that enhances communication in a noisy environment wherein a wanted signal beamformer is an adaptive beamformer being adapted only if no signal is transmitted from the wanted signal direction. June does not teach or suggest a beamformer.

Yang describes noise suppression for a wireless communication device. A *noise* signal is adapted during periods of non-speech activity (cols. 11:28-30, 36-38; 10:36-39, 44-47). Neither June nor Yang teach or suggest that a *wanted* signal *beamformer* is an adaptive beamformer being adapted only if *no* signal is transmitted from the wanted signal direction. Therefore, Applicants respectfully request withdrawal of this rejection.

CONCLUSION

In view of the remarks above, the Applicants respectfully submit that the claims are in condition for allowance, and respectfully request a Notice of Allowance. If any issues remain, the Applicants request that the Examiner call the undersigned attorney to expedite the prosecution of the application.

Respectfully submitted,

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